COUNTY OF LOS ANGELES
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JON W. FULLINWIDER
CHIEF INFORMATION OFFICER

Telephone: (213) 974-2008
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November 29, 2006

To: Supervisor Michael D. Antonovich, Mayor
Supervisor Gloria Molina
Supervisor Yvonne B. Burke
Supervisor Zev Yaroslavsky
Supervisor Don Knabe

From: Jon W. Fullinwider
Chief Information Officer

Dave Lambertson, Director
Internal Services Department

Dr. Bruce A. Chernof, Director and Medical Officer
Department of Health Services

Subject: **TELEPHONE SYSTEM SELECTION -- LAC/USC REPLACEMENT FACILITY**

On September 14, 2006, we submitted the 'Report on VoIP at the LAC/USC Replacement Facility' to your Board. The report discussed the viability of using VoIP technology in the LAC/USC Replacement Facility. In the report, we stated that within two months we would have a consultant review and validate the data network design and finalize our recommendations on the telephone system and related support.

ISD engaged Western Telecommunications Consulting (WTC), to validate the design for the data network for the Replacement Facility and to review the options for the telephone system. This was an important step since data network integrity and reliability is a critical success factor for IP telephony as well as to support the business practices (e.g., electronic medical records) planned by DHS. WTC's major findings and conclusions are:

- Overall, the planned data network design was appropriate.
- There were some areas where building infrastructure enhancements could be made to further strengthen the redundancy and resiliency of the network. DHS will work with Public Works to address these issues.
- VoIP was a viable solution as long as steps were taken to ensure technical staff were trained and day two support was in place.

It was determined by DHS, with concurrence from ISD and CIO, that the Cisco VoIP system with a NEC PBX as back-up would be the recommendation that would meet the immediate and future requirements of the LAC/USC Medical Center.

In addition, DHS must develop a plan and identify related resources for the ongoing support requirements for the data network and telephone system once the hospital is opened. They are currently working with ISD to engage a consultant to assist in developing an RFP to contract for these services. As mentioned previously, ongoing data network support is critical to the success of the replacement facility regardless of the telephony solution implemented.

To meet the hospital opening deadlines, we are proceeding with the procurement of the equipment and services required for the installation of the data network, and the Cisco VoIP phone system and the appropriate analog based back-up phone system. Concurrently, as indicated above, DHS is working with ISD to pursue contracting for ongoing support and management (day two and beyond) of the data network and telephone systems.

We recognize that proceeding with this solution at the replacement facility does not supersede the requirements for the Board's approval of a County-wide standard related to VoIP as a strategy and Cisco as the baseline equipment.

JWF:DL:
BAC:ygd

c: David E. Janssen, Chief Administrative Officer

P/final/cio/voip/Telephone Selection for LAC-USC Replacement Facility

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September 7, 2006

TO: Bruce A. Chernof, M.D.
Director and Chief Medical Officer

Jon W. Fullinwider
Chief Information Officer

Dave Lambertson
Director, Internal Services Department

FROM: John R. Cochran, III
Chief Deputy Director

SUBJECT: **REPORT OF VOiP SITE VISIT TO NORTHWESTERN UNIVERSITY MEDICAL CENTER**

Attached is the final report that discusses the findings of the site visit team from the Department of Health Services (DHS), Internal Services Department (ISD), and the Chief Information Office (CIO) to Northwestern University Medical Center (Northwestern). Although this document was reviewed by the respective participants and their comments incorporated, DHS takes total responsibility for its content.

Our site visit was extremely productive. It demonstrated the value of VOiP technology in a sophisticated and complex healthcare environment. The DHS staff came back from this visit excited for the potential the technology offers our facilities to provide contemporary communications technology which can add new features as the healthcare environment adapts this technology to the hospital setting.

As you are aware, hospitals have not been on the leading edge of technology adoption in areas where potential concerns about 24x7x365 availability are involved. Of the more than 5,700 licensed hospitals in the U.S., a small number were identified in your research and the research conducted by CISCO that had actually installed a VOiP solution. In Patrick Anderson's conversation with Gartner's VOiP expert, he noted that hospitals across the country have been very slow to adopt this technology and for the most part are in the planning stage. Northwestern, widely recognized for leading the hospital industry in technology adoption, only deployed VOiP in their clinical nursing areas in the past 12 months, despite having been evaluating and working on it for more than 7 years. We received the benefit of their many years of experimentation, testing, evaluation and implementation as a result of our site visit.

Patrick Anderson and I fully support the deployment of VOiP voice technology at LAC+USC, incorporating the critical success factors learned from our site visit and research. The site visit report also reflects the recommendations made by the Northwestern and CISCO VOiP hospital technology staff on the steps necessary for LAC+USC to have a successful install and operation of VOiP. We plan on developing a plan which reflects these components with ISD and the CIO and to proceed with completing the telecommunications plan for the LAC+USC complex.

If you have any questions, please call me.

JRC:jrc

Attachment

c: Patrick Anderson
Pete Delgado

Health Services
LOS ANGELES COUNTY

Technology Evaluation
Department of Health Services
Voice Over IP – LAC-USC Medical Center

Executive Summary and Recommendation

The Department of Health Services recognizes the functionality of VOIP and recommends the technology be deployed across the DHS enterprise subject to the critical success factors for the successful deployment of the technology. The ISD VOIP engineering team and the LAC+USC I.T. leadership must work together to incorporate the 13 critical success factors into the planning, architecture, and ongoing operational component of the VOIP project. If that is done, our visit confirms that VOIP can be effectively used in a complex, multi-building hospital environment.

Objective of Evaluation:

Deploy a cross functional team from the County of Los Angeles to identify an academic hospital comparable to the LAC+USC Medical Center in terms of number of beds and volume of patients that has successfully deployed VOIP. Perform on site validation and first hand review of the technology. A thorough review included the following:

- Evaluation of reliability
- Evaluation of functionality
- Evaluation of cost effectiveness
- Evaluation of lessons learned including the documentation of the critical success factors for implementation and ongoing operations.

Evaluation Team:

- John Cochran – Chief Deputy Director, DHS
- Patrick Anderson – Chief Information Officer, DHS
- James Yu – I.T. Manager, LAC+USC Medical Center
- Rosie Jones - Telecommunications Manager, DHS
- Dennis Shelley – Associate CIO, County of LA
- Robert King – Manager, Premise Systems Division, ISD
- Henry Kao – VOIP Project Manager, ISD

Date, Location and Point of Contact for Evaluation:

- August 30, 2006
- Northwestern Memorial Hospital, Chicago, Illinois
- Dwayne Moehl, Project Director, Information Services

Health Services
LOS ANGELES COUNTY

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Department of Health Services
Voice Over IP – LAC-USC Medical Center

EVALUATION

Comparable Hospital Selection

The DHS team members reviewed several potential hospital environments for this evaluation. These hospitals included,

- VA Portland, Oregon,
- Yavapai Regional Medical Center, Prescott, Arizona
- Northwestern Memorial Hospital, Chicago, Illinois
- First Health of the Carolinas, Pinehurst, North Carolina
- Exempla Healthcare, Denver, Colorado.

Northwestern Memorial Hospital was selected because this hospital is the primary teaching hospital for Northwestern University's Feinberg School of Medicine with 544 primary care beds and 167 beds in the Women's Hospital. The medical school also has other care facilities with additional beds. It is the largest birthing center in the state with nearly 10,000 births annually. The emergency department is a Level 1 Trauma Center which treated over 70,000 patients last year. The Medical Center has approximately 6,500 employees including a medical staff of 518 residents and 125 fellows.

The other hospital environments were not comparable to LAC+USC resulting in the selection of Northwestern Memorial Hospital.

Review of the Technology Decision by Northwestern Memorial

Northwestern is very similar to LAC USC Medical Center in that they used Centrex from the phone company (AT&T). Northwestern spent 7 years evaluating the new VOIP technology to replace Centrex. The replacement goals were:

a) Replace Centrex: cost of Centrex was escalating for both voice and voicemail.
b) Studied Centrex reliability: although never had system wide outages, had constant loss of individual service to individual phones.
c) Goal was to have information for staff anytime and anywhere, not just at fixed sites.
d) Wanted to eliminate 1-2 week delays in getting Centrex moves-adds-changes performed by AT&T the local telephone carrier.
e) Wanted an integrated single vendor solution vs. best-of-breed multi vendor solution for reliability and single response – no "finger pointing" about whose parts didn't work.

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Department of Health Services
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Northwestern also felt that the Centrex offering did not provide for new functionality and VOIP is adding new functionality at a consistent rate. Northwestern issued RFP in 2002 for VOIP system. They performed research and vendor comparisons and chose Cisco because of their market share and unique capability to leverage the data network with more advanced functionality and reliability than other vendors which included Avaya as the runner up. Northwestern also wanted a technology that was scalable and they believe that Cisco will meet that significant requirement as Northwestern is experiencing significant growth.

Review of the Operational Component

The review of the operational component consisted of working with the Hospital VOIP engineering team and with the executive I.T. management team. We discussed the reliability, functionality, cost effectiveness, and lessons learned. The lessons learned section had significant insight for the County team in terms of learning first hand about critical success factors. These factors should be the primary action items as a result of this evaluation.

Evaluation of the reliability of the VOIP system

Prior to the VOIP implementation at Northwestern, the engineering group was incurring approximately 300 tickets per month for voice outages within the enterprise. After the VOIP implementation the team is incurring approximately 15 voice outages per month. The reliability according to the engineering team has increased significantly.

The engineering team did state that there were some issues at start up that would have been avoided if a test environment was available prior to deployment as integration with voice mail for campus partners did fail. Rigorous change management also contributes to high availability as all changes to the environment are reviewed, tested, and recovery plans are documented. All technicians are also aware of all changes to assist with fault isolation and resolution. The nurses on a medical ward and the nursing supervisor and ward secretary also reported no reliability issues. At each clinical area, a red phone is installed using a local PBX for emergency internal communications. Since they cut over to VOIP in July 2006, they have not had to use the emergency phone.

The engineering team stated that their high degree of reliability is due to the redundant hardware eliminating all single points of failure at the server, storage, switch and power supply level. Northwestern built 3 complete VOIP server locations so that if any one location failed, they had 100% redundancy in the other two locations providing failover. Further, the team noted that multiple phone company central office points of entry are also required to ensure critical success. Implementing a program of 24 x 7 monitoring of the systems to identify early

indicators of problems and intervention with urgency is critical to maintain high availability of the systems. Migrating from a multi-vendor data solution to a single vendor solution for a voice and data network system also contributed significantly to the reliability. Northwestern was working with 3Com, Cisco, Cabletron, and Checkpoint to manage the infrastructure prior to the single vendor solution from Cisco. This single vendor solution allows for better integration and more complete monitoring resulting in overall reliability. The up-front planning around the human workflow is also very important. The workflow study needs to occur for each department prior to deployment to ensure critical processes are not broken which could result in a work slowdown or work stoppage. One solution is to have a branding campaign and initial training of supervisors and management and ask them to consider workflow implications and then have the deployment team further analyze the input from the supervisors and management. The workflow and dial plan/profile setup is a critical success factor. Comprehensive user training is also a factor. Both Cisco and Northwestern recommended that a Cisco top tier integrator with their proven processes be utilized for infrastructure implementation and setup.

Evaluation of the functionality of the VOIP system

Northwestern is very happy with the current and future functionality of the Cisco VOIP telephony solution. Today the largest benefit is from the nurse station ability to "park" a call and page the nurse with "call park" number who can pick up the call from anywhere within the hospital. This has a significant time savings impact on the ward nurses and the ward secretary. The secretary stated that her call handling time has been cut in half as she does not have to follow up with nurses to ensure they get the calls. Northwestern is also expanding the use of the integration with the wireless access points. Doctors are piloting using the Cisco wireless phone which allows them integration with the telephone at all times. The features include; push to talk and clinician paging. The physicians and nurses will not have to leave the patient to communicate with peers and nurse stations. This wireless integration will also allow for patient charting at virtually all locations with the addition of the Mobile Access solutions that integrate with the wireless access points. This solution improves wireless access by 35%.

Evaluation of the cost effectiveness of the VOIP system

Northwestern was able to immediately see a return on investment simply by migrating the voice mail boxes of 6,000 users from Centrex to the VOIP Voice Mail system. This saved about $40,000 per month. The cost of vendor support for moves, adds and changes significantly eliminated with the implementation of VOIP. Overall, they achieved cost reduction on the support of Centrex telephone system of $1.0 million per year. Northwestern was able to deploy VOIP on budget and they have met their ROI targets.

Health Services
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Evaluation of the lessons learned of the VOIP system

The Northwestern team shared their experience in the areas of critical success factors which they strongly urged the County engineering team to consider:

- Rigorous change management including a separate test environment.
- Redundant hardware– single points of failure eliminated
- Top tier integrator professional services for implementation
- Multiple phone company central office points of entry
- 24 x 7 monitoring and staffing in a network operations center
- Voicemail integration analysis with campus partners (medical school)
- Single vendor solution
- Workflow analysis and design prior to implementation at the unit level
- Supervisor training
- User training
- Deploy VOIP in phases, first to IT, administration next and finally clinical areas
- Establish a Network operations Center to monitor, maintain and repair VOIP system at a level equal or better than current vendor
- No new technology gets deployed to a clinical area or new building before full test and acceptance in existing buildings

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DAVID E. JANSSEN
Chief Administrative Officer

January 11, 2007

To: Supervisor Zev Yaroslavsky, Chairman
Supervisor Gloria Molina
Supervisor Yvonne B. Burke
Supervisor Don Knabe
Supervisor Michael D. Antonovich

From: David E. Janssen
Chief Administrative Officer

SELECTION PROCESS FOR A COUNTYWIDE VOICE OVER INTERNET PROTOCOL (VOIP) STANDARD ARCHITECTURE

On October 3, 2006, your Board directed that we evaluate whether a new selection process should be conducted for the selection of a Countywide VOIP architecture standard given the findings of the Auditor-Controller's September 22, 2006 report to your Board. In determining the evaluation method for the ultimate selection of Cisco equipment as the County's standard VOIP architecture, we have considered 1) the major criterion utilized in the selection process, and 2) the development of recommendations to ensure future processes to select information technology standards are conducted in an effective manner.

In an effort to assist with the evaluation, the Chief Administrative Office engaged Coplan and Company to provide consultant services consisting of an independent assessment of the County's Request for Information (RFI) selection process for the County's VOIP architecture standard.

Findings of the Coplan and Company assessment include:

- There does not appear to be any adverse impact regarding the inclusion of content in the RFI related to information developed by manufacturers of VOIP equipment. The County utilized a standard practice of considering manufacturers' information to assist in the preparation of the RFI.

- When establishing a standard for quality and reliability as outlined in the RFI, cost is not a key factor in establishing a quality standard that meets the requirements of the County. Cost is a factor, however, when acquiring equipment and software from a reseller based on the County VOIP standard.

- It is advisable to adopt a VOIP manufacturer for the entire County. If the County uses more than one manufacturer, it will likely encounter some interoperability and support issues. Interoperability remains a critical issue at the present time, but will become less of a factor as industry standards for VOIP become more mature and all manufacturers adopt such standards.

A copy of the final report produced by Coplan and Company is attached (Attachment I) for reference.

Request for Information (RFI)

The Chief Information Office (CIO) and the Internal Services Department (ISD) utilized a Request for Information (RFI) selection process to assist in the selection of a manufacturer to provide the standard architecture for the County's planned VOIP projects. As detailed in the Report, the Auditor-Controller found that, while the RFI is generally not utilized for source selection, in this case the RFI process is technically comprehensive and appeared to have been objectively scored. However, the Report noted several scoring anomalies in the RFI process in the form of mathematical errors. The Internal Services Department (ISD), in conjunction with the CIO, corrected the scoring errors and issued a memo to the Auditor-Controller on October 18, 2006 that included a revised scoring summary for the RFI. The mathematical errors did not change the overall outcome of the ranking of the manufacturers that were considered as part of the RFI process and Cisco continued to be the highest ranked vendor that responded to the RFI.

The Report further suggested that cost should be weighted more heavily among the various evaluation components set forth in the RFI. For a typical Request for Proposals (RFP) selection process, the County's Fiscal Manual provides that departments should ensure that the cost is assigned the appropriate weight so that the County maximizes cost savings. The Auditor-Controller's review of the "Theoretical Dollar Costs for Hypothetical Implementation Models" submitted by various respondents to the RFI indicates that the Cisco solution had the highest price among all respondents. However, since many manufacturers, including Cisco, sell their products through authorized dealers and not directly to end users, the pricing included in the RFI would not necessary be indicative of actual prices that would be provided by authorized dealers.

In an RFP process, the Auditor-Controller specifically recommends that cost be assigned a weight that is at least equal to the highest other evaluation criteria. Under the RFI process which was conducted, cost was not a major criterion in the selection process. The highest weighted category was 2,500 out of 10,000 total points. The theoretical pricing model was only weighted 1,000 out of 10,000 total points. The CIO and ISD have indicated that evaluation weightings for information technology procurements be based on "best value." This approach provides that the RFI committee evaluate and compare all relevant factors, in addition to cost, so that the overall combination of factors addresses the ultimate objectives of the RFI process. The purpose of establishing a VOIP standard was to select the **best** product for the County and ISD believes that weighing cost more heavily in the RFI process would not have achieved that objective. We concur with this belief.

The critical nature of telecommunication systems in many of the County's facilities and programs require selection of infrastructure that provides the greatest degree of reliability, enhanced functionality, and a variety of other technical features that are developed in consultation with end-users and County technical staff. The Auditor-Controller's analysis of non-cost factors, which were considered under the RFI, indicates that Cisco was allocated 8,496 of the 9,000 available points. The second-rated vendor in non-cost factors received 7,615 of the 9,000 available points for such factors. Thus, the second-rated vendor received 85% of the non-cost points versus 94% achieved by Cisco. Although Cisco received the fewest points in the cost category, the relative weights associated with the non-cost factors indicate that the solution recommended by Cisco would provide the best technology based on the overall non-cost criterion. The specific non-cost factors that are deemed critical to the implementation of VOIP systems include:

- IP Telephone System
- Manufacturer Capability and Vision
- Maintenance and Support

The RFI solicitation consisted of 9 sections. Larger sections were broken down further for assigning points. A total of 10,000 points were allocated accordingly:

1.0	Scope	100
2.0	Proposal Preparation	200
3.0	Manufacturer Capability and Vision	2,200
4.0	IP Telephone System	2,500
5.0	Voice Mail and Unified Messaging	1,000
6.0	IP Call Center	500
7.0	Maintenance and Support	2,000

8.0	Cost Models		1,000
9.0	Reference		500
		Total	10,000

Attachment II provides a description of each of these categories and provides additional information on the design of the RFI.

The RFI process only resulted in an architectural technology standard. Departments can competitively utilize the ISD Master Service Agreement and request a list of price quotes from different vendors. This process would result in the County receiving the most competitive prices for the prescribed equipment standard. The County currently has five licensed Cisco vendors that can be utilized for actual project bids.

Interoperability Issues

The County has committed to the utilization of Cisco VOIP technology in several of its facilities. Changes to the current VOIP architectural technology will impact the interoperability between various locations. The consultant's review indicated that interoperability could be a critical issue in the current environment and concurred with the County's decision to utilize a single manufacturer given the existing environment.

The total number of existing or planned Cisco VOIP devices exceeds 11,000. County facilities with completed or planned Cisco VOIP architecture include:

ISD Supported Systems

Completed Locations (including the number of devices):	
Auditor-Controller (Shared Services/Wilshire)	55
ISD (TeleComm/Eastern Ave)	228
DCFS (Palmdale)	290
DPSS (120th and Vermont)	403
DCFS (Glendora and Call Center)	460
Animal Control (Call Center Network)	87
Mental Health (Vermont)	242
East Los Angeles County Hall	74
Subtotal	**1,839**

Implementation in Process (including number of devices)	
Coroner Headquarters	400
Probation (Vermont)	125
ISD Call Center (Downey)	125

DPSS Call Center (El Monte)	130
Public Health Lab (Rancho Los Amigos)	70
DHS (LAC+USC)	6,000
DPSS Northridge (Corbin)	350
Subtotal	**7,200**

Sheriff Supported Systems

Completed Locations (including the number of devices):	
Lakewood Station	170
San Dimas Station	175
Palmdale Station	185
Special Enforcement Bureau	105
Sheriff's Communications Center	150
Century Station	175
Century Regional Detention Facility	300
High Tech Crime Lab	135
Terrorism Early Warning Center	130
Norwalk Facility	160
Miscellaneous (26 locations)	115
Subtotal	**1,800**

Community Development Commission Supported Systems

Headquarters	250

Network monitoring of VOIP solutions requires special software and specific training for ISD network staff. Currently, ISD has trained over 80 staff on Cisco's VOIP telephone system. Implementing a solution other than Cisco could impact ISD staff's ability to monitor and respond to operational issues in a timely manner. Additional training on any new architecture would be required to ensure an effective maintenance and monitoring program.

Recommendations

Based on the consultant's review and our findings that the RFI process was conducted properly and consistent with best practices in the information technology community, we make the following recommendations:

(1) The RFI process utilized for selection of a County VOIP standard is deemed adequate and complete.

(2) The CIO prepares a specific recommendation to your Board requesting the adoption of Cisco as the County's VOIP architecture standard.

(3) The CIO, in consultation with the Board offices, ISD, CAO, and involved County departments, develop a governance structure that provides for an efficient process to:

a. Develop and recommend policy directives and strategies to your Board; and

b. Monitor and update technology standards, as needed, consistent with Board-approved directives and strategies.

Please contact me, or your staff may contact Veronica Cox of this office at (213) 974-4366 for any questions.

DEJ:DL:SK
DD:VC:kd

Attachments

c: Executive Officer, Board of Supervisors
County Counsel
Auditor-Controller
Chief Information Office
Internal Service Department
Department of Health Services

ATTACHMENT I

VOICE OVER INTERNET PROTOCOL (VOIP)
RESPONSE TO QUESTIONS ON THE
REQUEST FOR INFORMATION (RFI)

Chief Administrative Office
Los Angeles County, California

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AND COMPANY

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December 21, 2006

David Janssen
Chief Administrative Officer
Los Angeles County
500 West Temple St., Suite #713
Los Angeles, CA 90012

Dear Mr. Janssen:

This letter transmits our answers to questions regarding the Voice over Internet Protocol (VoIP) Request For Information (RFI).

We wish to acknowledge the help of personnel from the County who supported the preparation of this assessment and the opportunity to be of assistance.

This report complies with the terms and conditions of the agreement between COPLAN AND COMPANY and Los Angeles County. We are available to discuss this report with you and other County personnel at your convenience.

Sincerely,

Scott R. Coplan
President

SRC:jrl

Enclosure

COPLAN
AND COMPANY

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COPLAN
AND COMPANY

1. EXECUTIVE SUMMARY

The County issued a Request For Information (RFI) in 2004 regarding Voice over Internet Protocol (VoIP). Recently the County identified various issues regarding this RFI. This report includes our response to six questions the County prepared to help resolve these issues.

1.1 SCOPE

The scope of this report includes the following:

- Interviews at the County involving 18 individuals from various County Departments (e.g., Internal Services Department, Department of Health Services, Office of the Chief Information Officer, etc.) that prepared the RFI and/or evaluated responses from manufacturers, and
- A review of County documentation made available to our assigned staff during this project.

1.2 APPROACH

We prepared our response to the questions identified by the County largely by conducting interviews and reviewing documentation. The individuals included in the interviews effectively described a response to the County's questions in a thorough and workable way that is generally understandable and sensible to all concerned. Exhibit 1 and Exhibit 2, at the end of this document, include a list of the individuals that we interviewed and the documentation that we reviewed, respectively.

Examples of documentation that we reviewed include the following:

- The RFI,
- Notes prepared by County personnel,
- Reports regarding evaluation of responses to the RFI,
- Memoranda regarding VoIP, the RFI and the associated outcome,
- Email correspondence and
- Other documentation.

1.3 COUNTY QUESTIONS AND OUR RESPONSE

Below is a summary of the County's questions and our response:

1. **Question #1** - Did the County use a tainted RFI process that favored a desired outcome?

   Response - There does not appear to be any adverse impact regarding how the County prepared the RFI. While we were able to prove that the RFI included information from at least one manufacturer, i.e., is Nortel; this and all other content of the RFI did not appear to taint the process.

2. **Question #2** - Is it standard practice to prepare an RFI with a Manufacturer's materials?

   Response - We found that the County properly employed a standard practice of using manufacturers' information to help prepare the RFI, especially since the County did not have VoIP expertise in 2004. We also found that the County effectively eliminated information in their RFI to avoid an outcome that favored a specific manufacturer.

3. **Question #3** - How important is cost when establishing a standard, since manufacturers typically sell their products through resellers?

   Response - Cost should not be a factor when establishing a standard for quality, which was the purpose of the County's RFI (i.e., it included requirements and a minimum acceptable level of functionality, service and performance). Cost is a factor when acquiring equipment and software from a reseller based on a County VoIP standard.

4. **Question #4** - Will the County have interoperability issues using multiple VoIP products?

   Response - Interoperability will become less of an issue as industry standards for VoIP become more mature and all manufacturers adopt them. However, until that time, the likelihood of interoperability issues between different products remains. It is even an issue even when using a single manufacturer VoIP product (e.g., different VoIP software versions installed at different County sites may be incompatible).

5. **Question #5** - Could the County require other manufacturers to be compatible with Cisco?

   Response - It is unlikely that the County could *require* any manufacturer to be "compatible" with another. However, if other manufacturers meet or exceed the same requirements met by Cisco, in the RFI, in terms of quality and VoIP industry standards, such manufacturers will likely be compatible with Cisco's VoIP.

6. **Question #6** – Is it more advantageous to limit the entire County to a single manufacturer's technology, or to adopt a standard "by major building" instead?

7. **Response** – We believe it is advisable to adopt a VoIP manufacturer for the entire County. If the County uses more than one manufacturer, it will likely encounter the same interoperability and support issues found in our response to Question #4. These issues also affect selection of a manufacturer by building. For example, if the County adopts a VoIP manufacturer as the standard by major building, a single department with offices in multiple buildings may have to support more than one VoIP manufacturer.

2. RESPONSE TO QUESTIONS

This section contains our response to questions raised by the County. Exhibit 1 and Exhibit 2, at the end of this section, include a list of the individuals that we interviewed and the documentation that we reviewed, respectively.

2.1 QUESTION #1 – DID THE COUNTY USE A TAINTED RFI PROCESS THAT FAVORED A DESIRED OUTCOME?

The County wanted to know if it appeared that the preparation of the RFI was "tainted" because portions of it were allegedly derived from a sample Cisco RFP.

2.1.1 Response

Our response to the County's question is as follows:

1. At no time were we able to determine the source of the RFP, including whether it came from Cisco. We received and reviewed a copy of the RFP, but it did not contain any manufacturer reference. During our interviews, we also asked questions regarding the source of the document. None of the interviewees could identify the source.

2. An ISD representative sent an email to Cisco regarding the RFP. Cisco responded that the RFP was not their document.

3. We reviewed the RFI and did not find anything included in or excluded from it that could influence the RFI process and the selection or avoidance of a specific manufacturer.

4. We determined during the interviews that Appendix A of the RFI came from Nortel. This and other features in the RFI could have come from other manufacturers; however, none of it was product specific, for example the RFI contained the following generic questions:

   - "How many simultaneous conference calls can be scheduled?"
   - "How many participants are supported per conference?"
   - "Are video phones available?"

5. The County engaged Gartner Group to assess the RFI. An ISD representative sent an email to Gartner regarding the RFI. A Gartner representative responded, "I finally had time to review your draft RFI. It looks very thorough and I like it." Gartner approved of the RFI and did not comment about whether the County included or excluded requirements that favored a specific outcome.

6. Manufacturers did not submit questions about the RFI focusing on a specific manufacturer's proprietary product. The County did reference "Option 81 System Lookup Message Utility" in one line item in the RFI, which relates to a Nortel proprietary product. The County included this single reference among the hundreds of requirements in the RFI. During the RFI question and answer period, the County responded to this issue raised by a manufacturer by instructing all manufacturers to, "Disregard reference to Option 81, System Message Lookup Utility."

7. No single evaluator scored an entire manufacturer response, making it very difficult to evaluate a proposal so that it would favor a specific manufacturer based on requirements derived from Cisco, Nortel or any other manufacturer.

8. Cisco scored lower than some other manufacturers on the sections in the RFI containing a significant portion of information from the RFP allegedly provided by Cisco; therefore, these questions did not give Cisco an advantage.

9. During the post-RFI debriefing, Avaya noted the County used an RFP allegedly from Cisco to prepare the RFI. The County indicated the RFI process was not tainted, and we concur, given the items listed above.

2.2 QUESTION #2 – IS IT STANDARD PRACTICE TO PREPARE AN RFI WITH A MANUFACTURER'S MATERIALS?

Before responding to this question, we reviewed the County's VoIP RFI preparation process as described below. The County indicated that our review of the RFI preparation process should not include a review of the evaluation process because the County Auditor-Controller previously reviewed it.

Near the end of 2003, Olive View Medical Center planned to replace its aging Private Branch Exchange (PBX) with VoIP. Based on concurrence of the Office of the Chief Information Officer (CIO), Internal Services Department (ISD) and Department of Health Services (DHS), the County decided to issue a solicitation to determine the best VoIP platform for both Olive View and other County facilities.

Facilitated by the CIO, a Committee developed the RFI composed of ISD voice and data personnel, and DHS, Department of Social Services and Child Support Services Department representatives. The Committee also included an ISD Deputy Purchasing Agent who provided guidance during the RFI development process. The process included a cycle of weekly meetings to discuss changes to the draft RFI, followed by an updated draft distributed to the Committee membership for review before the next weekly meeting.

Most solicitation documents, such as an RFI, include a list of requirements assembled by an organization like the County. The County did not have significant expertise in VoIP at the time they began to prepare the RFI. Consequently, members of the Committee prepared a list of VoIP specifications from a variety of sources, e.g., materials from different manufacturers, RFPs from other jurisdiction found on the Internet, experts like Gartner Group, etc. The Committee tailored these various feature lists to meet the County's unique requirements and assembled them into the RFI.

2.2.1 Response

Our response to the County's question is as follows:

1. It is common practice to avoid "re-inventing the wheel" by starting with a features list from a variety of sources and tailoring them to meet the County's requirements. Examples of sources for features include the following:

    - Manufacturers,
    - Vendors,
    - Experts,
    - Professional, government and industry organizations,
    - Publications, e.g., industry journals,

- Customers or jurisdictions that previously prepared requirements for their RFI or RFP, etc.

2. It is acceptable according to industry standards to rely on manufacturers' input when preparing requirements. We examined industry standards on project management provided by the Project Management Institute (PMI), Institute of Electrical and Electronic Engineers (IEEE), and the Carnegie Mellon Software Engineer Institute (SEI). None of the standards we reviewed from these organizations specifically prohibited the use of information from manufacturers, etc. in the preparation of requirements. In fact, IEEE Standard 830-1998, Recommended Practice for Software Requirements Specifications, indicates it is helpful to obtain input from third parties, such as suppliers, when preparing requirements because customers usually do not understand specifications well enough to prepare their requirements. This is precisely what the County did.

3. Another key question is whether it is appropriate to include manufacturer's proprietary requirements in an RFI for subsequent response by that and other manufacturers. In this case, for example, PMI maintains a Project Management Code of Professional Conduct, which prohibits professional conduct involving a conflict of interest that compromises legitimate interest of others. While this standard would prohibit including a manufacturer's information in an RFI, which could cause a favorable outcome for that manufacturer, our response to Question #1 indicated that that the County did not do this.

2.3 QUESTION #3 – HOW IMPORTANT IS COST WHEN ESTABLISHING A STANDARD SINCE MANUFACTURERS TYPICALLY SELL THEIR PRODUCTS THROUGH RESELLERS?

First, before answering this question, we believe we must define the term "standard" in the context of VoIP during 2004 when the County issued their RFI. The definition of standard in this context is a specification that ensures industry-wide uniformity and conformance with a level of quality. The RFI included questions regarding many standards; however, in 2004, the industry did not have fully developed VoIP industry standards and these standards continue to evolve today.

Second, it is very important to underscore that VoIP is a complex technology including both software and hardware that relies on many standards and not just one. Third, there are many sources of standards, e.g., governments, quasi-governmental or technological consortiums, private industry groups, etc. The RFI included a set of VoIP industry standards, which manufacturers responded to for purposes of assessing interoperability.

2.3.1 Response

Our response to the County's question is as follows:

1. Cost is not a key factor in establishing a quality standard that meets the requirements of the County.

2. Cost is a factor, however, when acquiring equipment and software from a reseller based on the County VoIP standard. The purpose of the RFI was to identify manufacturers that met the County's requirements, including VoIP industry standards, to ensure a certain level of quality. To illustrate this point, the County selected Cisco because it met the greatest number of the County's requirements including compliance with evolving VoIP industry standards. Now, when acquiring VoIP equipment and software, in conformance with the County's standard, the County should introduce cost as a factor.

2.4 QUESTION #4 – WILL THE COUNTY HAVE INTEROPERABILITY ISSUES USING MULTIPLE VOIP PRODUCTS?

Interoperability, or the capability of two or more systems working harmoniously together, is becoming less of an issue for VoIP. However, when the County issued their RFI in 2004, VoIP products from different manufacturers did not all conform to evolving VoIP industry standards and interoperate with each other seamlessly.

2.4.1 Response

Our response to the County's question is as follows:

1. The responses to the County's RFI in 2004 did not provide sufficient interoperability to assure seamless communications between VoIP products from different manufacturers.

2. Today interoperability is less of an issue; however, the County can expect some interoperability issues with VoIP features, for example, when sending a broadcast voicemail message between different VoIP manufactures' products.

3. Standardization on a single VoIP manufacturer will not eliminate all "interoperability" issues for the County. For example, the VoIP installations at DHS and ISD may have different software versions of Cisco's Call Manager, which may be incompatible. In addition, a manufacturer may use different teams to develop their own software or acquire software from a third party, introducing interoperability issues and associated costs among different modules within a single product. Consequently, while the County probably has fewer interoperability issues when standardizing on a single manufacturer's VoIP product, the County will not eliminate all interoperability issues by doing so.

4. Adding multiple VoIP manufacturers increases the complexity of an already highly complex technology, which may result in higher personnel support and system maintenance costs for the County. Examples of highly complex aspects of a VoIP environment compared to a traditional telephone environment include the following:

    - Adding new VoIP telephone sets to a data network incorrectly can slow down or even stop other systems that may use that network.

    - A technician working effectively with VoIP must know about data hubs, routers, switches, etc., which generally requires many months if not years of initial and ongoing training when compared to significantly less training requirements for traditional telephone systems.

    - VoIP must meet a higher standard of network performance when compared to other network-based applications. For example, users generally find occasional email outages and network failures acceptable. In contrast, the

telephone industry assumes that there will be 99.999% uptime or no more than five minutes of downtime per year.

Not only is VoIP very complex, using products from different VoIP manufacturers in the absence of mature interoperability standard requires, at a minimum, the following:

- Maintenance of separate parts inventories,
- Training on separate manufacturer products and software,
- Additional software and hardware to allow interoperability,
- Support of different VoIP and interoperability products and software from more than one manufacturer.

Consequently, adding multiple VoIP manufacturers unnecessarily increases the cost and support complexity for VoIP.

2.5 QUESTION #5 – COULD THE COUNTY REQUIRE OTHER MANUFACTURERS TO BE COMPATIBLE WITH CISCO?

To avoid the appearance of favoring a particular manufacturer, the County used an RFI and required all manufacturers to meet a minimum set of requirements including VoIP industry standards for interoperability. Unfortunately, VoIP industry standards are still evolving despite the fact that all manufacturers point to the use of VoIP industry standards as evidence of their interoperability.

2.5.1 Response

Our response to the County's question is as follows:

1. It is unlikely that the County could *require* any manufacturer to be "compatible" with another.

2. Our response to Question #4 indicated that interoperability and support of a complex VoIP environment involving more than one manufacturer is not advisable. However, if other manufactures meet or exceed the same requirements met by Cisco, in the RFI, in terms of quality and VoIP industry standards, such manufacturers will likely be compatible with Cisco's VoIP system.

2.6 QUESTION #6 – IS IT MORE ADVANTAGEOUS TO LIMIT THE ENTIRE COUNTY TO A SINGLE MANUFACTURER'S TECHNOLOGY, OR TO ADOPT A STANDARD "BY MAJOR BUILDING" INSTEAD?

There appears to be two fundamental questions underlying the County's question about whether or not it is advantageous to install different manufacturers' VoIP products by facility. These questions are as follows:

- Has the County made a decision to provide VoIP from a single source or multiple sources?
- Which is more advantageous for the County, multiple sources or a single source?

Our response below answers these two fundamental questions and the County's question.

2.6.1 Responses

Below is our response to the question: Has the County made a decision to provide VoIP from a single source or multiple sources?

1. It appears to us that the County will consider other manufacturers when the VoIP industry has mature interoperability standards. The County stated in their 2004 RFI Evaluation Report that, "Since the IP telephony industry does not currently offer products based on interoperability standards for the seamless interconnection of different manufacturer's IP telephone systems, the County seeks to standardize, ***for the present*** *[emphasis ours],* on a single manufacturer's platform that will satisfy the County's telephony requirements."

2. The County is not conducting a wholesale replacement of all of its existing telephone systems with VoIP supported by a single manufacturer. The County is using Cisco when the time comes to replace outdated County telephone systems and when it builds new facilities. Since the RFI in 2004, the County has implemented VoIP to support approximately 2,000 of its 145,000 lines or just over 1% of County lines.

3. The limited use of VoIP from a single source amounts to a pilot test for the County. The current reliance on ISD to supply VoIP support is equivalent to ISD acting as the County's telephone company for this type of telephony. Based on interviews with the Director of ISD and the County CIO, we understand that the County does not intend to continue as a telephone company for VoIP and expects to outsource this responsibility to a third party. The County's current use of a single source for VoIP makes future outsourcing much easier by reducing the County's transaction costs for outsourcing, e.g., preparing an RFP, evaluating proposals, negotiating an agreement, administering the agreement with a selected vendor, etc.

4. The County plans to test a VoIP option that they could use in addition to VoIP from Cisco, based on AT&T's recent addition of hosted VoIP services from their

central offices. The County is currently adding this new service, called Voice Dynamic Network Application (VDNA), to its existing Carrier Services Agreement with AT&T. If VDNA proves viable, the County could use it to replace Centrex services currently used by the County for approximately 50% of its lines. Central Exchange or Centrex is a telephone company hosted service charged per line, which provides switching at the telephone company's central office instead of at the customer's premises.

5. The County is currently preparing a new Carrier Services RFP, for release in 2007, which will offer another opportunity to consider additional VoIP options.

Below is our response to the question: Which is more advantageous for the County, multiple sources or a single source?

1. Use of multiple sources has a higher transaction cost for the County, e.g., preparing an RFP, evaluating proposals, negotiating agreements, administering an agreement with selected vendors, etc.

2. Integrating modules from a single source is generally less costly than integrating modules from multiple suppliers. The cost is generally higher when using VoIP from multiple sources because of interoperability issues even though this option will likely offer richer functionality. Please note that a single manufacturer may have interoperability issues within its own product, as indicated in our response to Question #4.

3. Using multiple sources or products from different VoIP manufacturers hinges on full interoperability or additional software and hardware to allow interoperability. Given VoIP standards are evolving, full interoperability is not completely available so the County would have to acquire, maintain and support additional software and hardware for interoperability. In addition, please note there are greater support costs when using multiple sources, as documented in our response to Question #4.

4. Given the potential cost and support concerns associated with VoIP interoperability, it is easy to understand the appeal of standardizing on a single source to simplify support and reduce costs. This assumes there is a single source that does everything the County requires. We believe the RFI determined that Cisco met a majority of the County's requirements when compared to other VoIP manufacturers. We addressed the issue of cost in our answer to Question #4.

5. VoIP is in a period of rapid transformation. Selecting a single source prevents the County from acquiring products from innovative manufacturers that the County could add to its VoIP environment in a multiple source approach. It appears from our review of the County's RFI Evaluation Report that they were able to select a manufacturer that met their needs without having to consider a multiple source approach and its associated interoperability costs and support issues. Also, acquiring additional innovative products often includes risks associated

with solutions that the market has not satisfactorily tested. If such products are truly innovations, they tend to have a higher cost since they generally do not face significant price competition. Consequently, it is best for the County to wait for a single source manufacturer to adopt these products when they are less innovated, more widely tested in the market and less costly due to competition.

6. The maximum volume discount offered by one or more VoIP manufacturer will not be significantly different because of the County's size (i.e., approximately 145,000 lines). For example, if the County solicited VoIP from two manufacturers at 65,000 and 80,000 lines, respectively, it is likely that the lower amount would still justify maximum discounting from that manufacturer.

7. The Total Cost of Ownership for VoIP from a single source is not likely to be more than from multiple sources. The County may, for example incur a 10 to 15% higher costs from a single source. However, the County would not necessarily incur increases in higher personnel support and system maintenance costs associated with multiple VoIP manufacturers as noted in our response to Question #4.

Below is our response to the County's question:

1. We believe it is advisable to adopt a VoIP manufacturer for the entire County. If the County uses more than one manufacturer, it will likely encounter the same interoperability and support issues found in our response to Question #4. These issues also affect selection of a manufacturer by building. For example, if the County adopts a VoIP manufacturer as the standard by major building, a single department with offices in multiple buildings may have to support more than one VoIP manufacturer.

2. There may only be a limited price advantage if the County acquires VoIP from a single manufacturer for one "major" building used solely by a single department, e.g., LAC+USC Medical Center replacement facility. This price advantage is associated with a competitive bid among different manufacturers at the time the County solicits VoIP bids for that major building. That price advantage is temporary since all subsequent VoIP purchases for that building will be a sole source acquisition with the manufacturer selected during the initial solicitation. In addition, the County could encounter support and interoperability issues, as described in our response above, if a department has one manufacturer's VoIP product at one building and another manufacturer's VoIP at other departmental locations.

Exhibit 1 – List of Interviewees

Last Name	First Name	Department
Agostinetti	Mike	CSS
Chin	Patti	ISD
Cuevas	Gloria	CSS
Fullinwider	Jon	CIO
Holmgren	Jack	ISD
Jones	Rosie	DHS
Kao	Henry	ISD
Karimi	Ali	DHS
Lambertson	Dave	ISD
Lang	Tom	ISD
Leon	Marcus	ISAB
Mok	Ada	ISD
Mayer	David	ISD
Norris	Mike	ISD
Orozco	Oscar	DHS
Shelley	Dennis	CIO
Smith	Nicole	DHS
Tsuyuki	Doug	ISD

CGPLAN
AND COMPANY

Exhibit 2 – Documentation Used During this Review

Document	Type	Author	Date
Background Material on the VoIP RFI	Notes	Dennis Shelly, ISD	11/20/06
Response to Dennis Shelly from Cisco regarding RFP template	Email	James Hersey, Cisco	12/18/06
Response to Dennis Shelly from Gartner Group regarding RFI Review	Email	Earl Steman, Gartner Group	1/26/04
Implementation Plan for Auditor-Controller Voice over Internet Protocol (VoIP) Report Recommendations	Memo	Jon Fullinwider, CIO Dave Lambertson, Director, ISD	11/1/06
IP Telephony Request For Information Solicitation 214532, Evaluation Report	Report	Dennis Shelly, ISD	5/25/04
IP Telephony RFI Development Committee Roster	Memo	Dennis Shelly, ISD	Unknown
IP Telephony Solicitation 214532 Clarification Questions	Q & A	Dennis Shelly, ISD	Unknown
Modern Telephone Systems	Memo	Jon Fullinwider, CIO	6/30/04
New Telephone System	Memo	Jon Fullinwider, CIO Dave Lambertson, Director, ISD	7/20/04
Report of VoIP site Visit to Northwestern University Medical Center	Memo	John R. Cochran, III, Chief Deputy Director, DHS	9/7/06
Report on VoIP at the LAC/USC Replacement Facility	Memo	Jon Fullinwider, CIO Dave Lambertson, Director, ISD Dr. Bruce A Chemof, Director and Medical Officer, DHS Don Wolfe, Director, DPW	9/14/06
Request For Information #214532, IP Telephony, County of Los Angeles	RFI	Multiple Departments	2/24/04
Request For Proposal for Next Generation IP-Based Voice, Data and Video Communications System	RFP Template	Unknown	Unknown
Selection and Implementation of a VoIP Standard, and Related Plan Modifications at the LAC/USC Replacement Facility – August 22, 2006 Board Agenda Item #19	Memo	J. Tyler McCauley, Audio-Controller	9/22/06
VoIP Standards	Memo	Dave Lambertson, Director, ISD	10/19/06

VOIP Evaluation Teams and Points Allocation

(Excerpted from the IP Telephony RFI Evaluation Report of May 25, 2004)

BACKGROUND

The Internal Services Department (ISD) in cooperation with the Chief Information Office (CIO) commissioned a study team in late 2002 to investigate IP Telephony and its technical and business implications for the County. With the high-performance Enterprise Network (EN) at more than 120 locations and the CJIS building networking at over 60 places of business, the County is well-positioned to realize the benefits of Voice over IP (VoIP) systems. Among other findings, the team concluded that the relatively early implementation of standards (e.g., H.323 and SIP) did not provide sufficient interoperability to assure seamless communications between systems of different manufacturers. Gartner Group, an industry advisory service to which the County subscribes, was consulted in reaching this conclusion, and they also reviewed the RFI draft prior to release. Therefore it is necessary for the County to select a single product until such time as interoperability is a reality.

Solicitation #214532 was posted to the County's Internet Purchasing web site on February 23, 2004, closing at noon on March 15, 2004. Nine vendors were sent copies of the entire solicitation by mail: Intertel, Nortel, Cisco, Avaya, Mitel, Alcatel, Siemens, 3COM and NEC America. In addition, all vendors registered for Commodity Code 725-57 (Telephone Systems, over 60 stations) received email notification of its availability.

A total of seven proposals were received by the deadline: Alcatel, Avaya, Cisco, Mitel, NEC and Nortel. MCI proposed a managed VoIP service, not a hardware system as specified, and was considered Non-Responsive.

Because it is the County's intention to add the VoIP systems to an existing TESMA master agreement as a new category, the selected manufacturer from this evaluation only becomes the preferred provider. No actual purchase order or award will be issued. Individual vendors (value added resellers) will then be qualified to respond to TESMA solicitations.

EVALUATION METHODOLOGY

A total of 20 people representing 6 departments comprised the evaluation committee. ISD staff represented several disciplines: telephone engineering, network engineering, telephone analysis, and telephone maintenance. This enabled the evaluation to progress in three parallel paths to minimize the time.

Tom Lang, Chair	ISD
Nicole Smith	DHS
Yvonne Parker	ISD (Deputy Purchasing Agent; advisor only)
Dana Scott	ISD
Rosie Jones	DHS
Jack Holmgren	ISD

Henry Kao	ISD
Oscar Orozco	DHS
Gloria Cuevas	DPSS
Mike Aros	ISD
Patti Chin	ISD
Dennis Shelley	CIO
Nancy Burnette	LASD
Marcus Leon	ISAB
Ali Karimi	DHS
Doug Tsuyuki	ISD
Mike Norris	ISD
Mike Agostinelli	DPSS
Sandy Mungovan	DHS
Bahgat Alexan	ISD

The RFI solicitation consisted of 9 sections. Larger sections were broken down further for assigning points. A total of 10,000 points were allocated accordingly.

1.0	Scope	100
2.0	Proposal Preparation	200
3.0	Manufacturer Capability and Vision	2,200
4.0	IP Telephone System	2,500
5.0	Voice Mail and Unified Messaging	1,000
6.0	IP Call Center	500
7.0	Maintenance and Support	2,000
8.0	Cost Models	1,000
9.0	Reference	500
	Total	10,000

Evaluation Committees

Entire Evaluation Committee rated: (2,500 points total)

1.0 Scope & Background
2.0 RFI Response & Submission
3.0 Manufacturer Vision & Capability

Three subcommittees were established to evaluate portions of the material.

Technical Subcommittee

Henry Kao, Chair	ISD
Dana Scott	ISD
Ali Karimi	DHS
Jack Holmgren	ISD
Mike Agostinelli	DPSS
Doug Tsuyuki	ISD
Oscar Orozco	DHS

Reviewed: (2,200 points total)
Section 4.0 IP Telephone Systems (except4.13 System & User Features and Section 4.17 Attendant Console)

System Features Subcommittee

Sandy Mungovan, Chair	DHS
Nancy Burnette	LASD
Rosie Jones	DHS
Gloria Cuevas	DPSS
Mike Aros	ISD
Patti Chin	ISD

Reviewed: (1,800 points total)
4.13 System & User Features (Appendix A)
4.17 Attendant Console (Appendix A)
5.0 Voicemail & Unified Messaging Systems
6.0 IP Call Center

Maintenance & Support Subcommittee

Dennis Shelley, Chair	CIO
Marcus Leon	ISAB
Tom Lang	ISD
Mike Norris	ISD
Nicole Smith	DHS
Bahgat Alexan	ISD

Reviewed: (3,500 points total)
7. Maintenance & Support
8. Cost Models
9. References

THE EVALUATION CRITERIA

The evaluation criteria were based directly on specifications in the RFI, scored in sections as outlined above. Because of the subcommittees, no one person scored the entire responses. Instead, each worked with their committee to evaluate and score the assigned sections. Responses and scores were discussed in subcommittee; however, the scores for each response section were averaged. Evaluators were instructed to apply the same criteria consistently across all responses, but there was no requirement for scores to be uniform or consensus. Extreme high or low scores not consistent with other ratings were reviewed.

Vendors were evaluated solely according to the information they provided in the RFI responses. The team would check other sources to determine the accuracy of the information provided, however, in order to guard against bias, the team members tried to avoid using prior knowledge or experience of a particular vendor's solution from

influencing the scoring, whether favorably or unfavorably, if the information is not provided in the RFI responses.

This is a comparative scoring process. Team members awarded points to each vendor according to the details and the substance of the vendor's answers relative to the answers that other vendors provided for the same questions. Comparatively, each vendor was judged based on how well it demonstrated that it understands the County's requirements and how convincingly it articulated its ability to deliver the VoIP solutions that will meet the County's needs.

1.0 Scope – 100 points

The RFI lists a number of goals for the project as follows:

1. What IP telephone system(s) meet the requirements of the various aspects of County government,
2. What IP telephone systems may interoperate with other manufacturer systems,
3. What IP telephone systems easily integrate with the County's current installed base of PBX and Centrex telephone systems and data networks,
4. What IP telephone systems are uniquely and robustly supported by the manufacturer and their channel partners,
5. What IP telephone systems integrate with other technologies to provide uniform converged services functionality, and
6. What IP telephone systems offer the County a suitable transition path from the current environment into a converged technology environment.

Section 1.0 representing 100 points overall was evaluated by the full committee in considering to what extent did the submitter grasp the County's purpose and submit a complete proposal responding to the requirements.

2.0 Proposal Preparation – 200 points total

Section 2.0 examines the quality of the proposal itself rather than the content and was evaluated by the full committee. A number of specific instructions were given for Proposal Format Specifications

> "Three (3) hardcopies of the proposal shall be delivered. Proposals must be typed or printed on 8½ X 11 inch paper, single-spaced, single sided. The proposal must be organized using a decimal numbering system. The pages of each section of the document must be sequentially numbered. All pages of the specification shall have the proposer's name typed or entered in ink in a margin, header, or footer. All insertions and attachments shall also so identify the proposer. Sales materials or brochures, if submitted, must be in a separately bound appendix. The sequence and format of the proposal shall be as follows:
>
> | Section | Contents |
> |---|---|
> | 0. | Cover |
> | 1. | Transmittal Letter |

2. Table of Contents
3. Discussion of Manufacturer Capability
4. Discussion of IP Telephone System
5. Discussion of Voice Mail and Unified Messaging System
6. Discussion of IP Call Center System
7. Discussion of Maintenance and Support
8. Cost Models
9. References
10. Appendices (Optional)
11. Attachments (Optional)

Other qualities evaluated were organization of the material, neatness, clarity, readability and typographical mistakes that impair reading and understanding.

3.0 Manufacturer Capability and Vision – 2,200 points

This section allocating 2,200 points was evaluated by the full committee. This section evaluated the Vendor's overall capability and position in the marketplace. To what extent has the Vendor been a leader in this technology? What is their track record? The committee was looking for a Vendor that would be around for a long time, is committed to the technology, has a vision of what the technology can do for the County in improving productivity and service delivery, and had the financial resources to do it. It is important to the County that the selected manufacturer be committed to the success of the County .

4.0 IP Telephone System – 2,500 points

Proposers were asked to describe the overall architecture and provide a diagram that illustrates all of the major network components, their role and interactions with each other. Where applicable, they were to indicate the operating system that the server software runs on including all possible servers, gateways and phones. A detailed list of features and desired capabilities were specified so the vendors could indicate whether they provided support and how that was accomplished.

The questions in this section are designed to assess each company's product capabilities for delivering the VoIP solutions that will offer the best fit for the County. The County's requirements are as outlined in Section 1.1 of the RFI document. The RFI responses from each vendor were evaluated to determine how clearly the vendor has demonstrated its ability to succeed in the converged IP network environment, and allow the County to take advantage of the VoIP solutions now without pre-maturely abandoning the traditional voice systems that are in use today. The evaluation for this section examined the technical attributes such as system architecture, VoIP functionalities, underlying hardware and software platforms, reliability, fault tolerance, redundancy and recovery features, system management and administration capabilities, IP phone features and functions, interoperability with the current environment, and the ability to interface with existing systems using specific standards and protocols.

Points for this section were allocated as follows:

4.1	System Overview	100
4.2	System Architecture	200
4.3	Reliability and Availability	150
4.4	Environmental Requirements	50
4.5	Advance Routing Features	100
4.6	911 Emergency Services	150
4.7	Section 508 / Accessibility	100
4.8	System Administration	100
4.9	Monitoring and Diagnostics	150
4.10	Security & Privacy	100
4.11	System Software and Hardware	200
4.12	Conferencing	100
4.13	System & Station Features	200
4.14	Station Hardware	100
4.15	IP Phone Features	100
4.16	Manager / Boss IP Phone	50
4.17	Attendant Console	100
4.18	Reporting & Call Detail	100
4.19	Trunk Interfaces	200
4.20	External Interfaces	150

5.0 Voice Mail and Unified Messaging – 1,000 points

Voicemail is an important capability for County departments. There are more than 35,000 voice mail boxes on the enterprise voice mail system operated by AT&T for Centrex and over 70 PBX's. This section examines what features and functionality is provided by the vendor's own voicemail system and how it might interface with the SBC system. The County seeks an VoIP voice mail enterprise solution that can scale to a very large number of users.

Proposals were evaluated for each Subsection with points available:

5.1	SBC Voice Mail Support	200 points
5.2	Enterprise IP Voice Mail	200 points
5.3	Voice / Messaging System	200 points
5.4	VM System Features	200 points
5.5	VM User Features	100 points
5.6	System Administration	100 points

Points were deducted reasons such as lack of detail, features not supported, requires downtime for upgrades and backups, no response to questions, and requires custom programming for fax management.

6.0 IP Call Center – 500 points

The County departments continue to implement large and complex call centers. It is necessary that the vendor's call centers be able to interface with departmental computer databases and provide reports to effective manage the call center. Vendors were asked to provide an overview of the call center architecture and list experience in the manufacturing, installation, and support of IP call center systems. They were asked for specific about hardware configuration, system software, agent station and software, computer telephony interface, web collaboration, email response management and fax management.

Proposals were evaluated for each Subsection with points available as follows:

6.1	Hardware	100 points
6.2	System Software	100 points
6.3	Agent Station & Software	200 points
6.4	Computer Telephony Interface	25 points
6.5	Web Collaboration	25 points
6.6	Email Response Management	25 points
6.7	Fax Management	25 points

7.0 Maintenance and Support – 2,000 points

This section deals with the ability of the manufacturers to provide support to their products and the County before and after installation. The County is concerned with the breath of support and responsiveness of the organization in providing services directly to the County, through their business partners, or in support of County staff providing internal support services.

Points were allocated according to the following:

7.1	Warranty	200
7.2	Training	200
7.3	Back-up	50
7.4	Installation and Support	600
7.5	Maintenance	500
7.6	Web Site	50
7.7	Technical Assistance Center	200
7.8	Emergency Services	200

8.0 Cost Models – 1,000 points

In this section 4 different 'model' systems were specified for the manufacturers to provide proposed solutions using their products. Detailed pricing for all the components was required. Scoring was based on completeness of their proposal and total system prices. Although 4 models were priced, only 3 were scored as was described in the RFI; Configuration A was included for informational purposes only. Scoring was based

on a fixed amount for low price, second low bid, third low price, etc., for each scored model, as follows:

	Configuration A1	Configuration B	Configuration C
	Large	Medium	Small
Best price in category	250	300	250
Second best price	200	200	200
Third best price	150	150	150
Fourth best price	100	100	100
Fifth best price	50	50	50

Points were allocated according to the following:

Completeness	200
Large System A1	250
Medium System B	300
Small System C	250

Having no independent means to validate the completeness and accuracy of the proposed configurations, the evaluation subcommittee took at face value the components proposed and prices submitted. Completeness scores were based on how well the responders described their solutions and products proposed as specified in the RFI.

9.0 References – 500 points

The RFI requested 5 references of IP telephone systems that had been in operation for at least one year. At least one of the references should be for a government agency, one a call center or voice mail application, one be over 3,000 IP phones, and one between 80-120 IP phones. One reference could fulfill more than one requirement. 50 points were available for each of these requirements and well as 50 points for providing complete and correct reference information. The referenced systems must be in the United States and southern California locations would be viewed more favorably. The Evaluation committee contacted all references with a series of standard questions via email, fax, or phone, if contact information was provided. Not all reference contacts responded to the Committee's questions. Furthermore, some evaluators believed that independently verifying references was so important that they deducted all or most all of the points for unverified references.

Points were allocated according to the following:

Correct Information	50
Government Agency	50
Voice Mail/Call Center	50
3,000 IP Phones	50
80-150 IP Phones	50
Reference 1	50
Reference 2	50
Reference 3	50
Reference 4	50
Reference 5	50

VOIP Attachment II